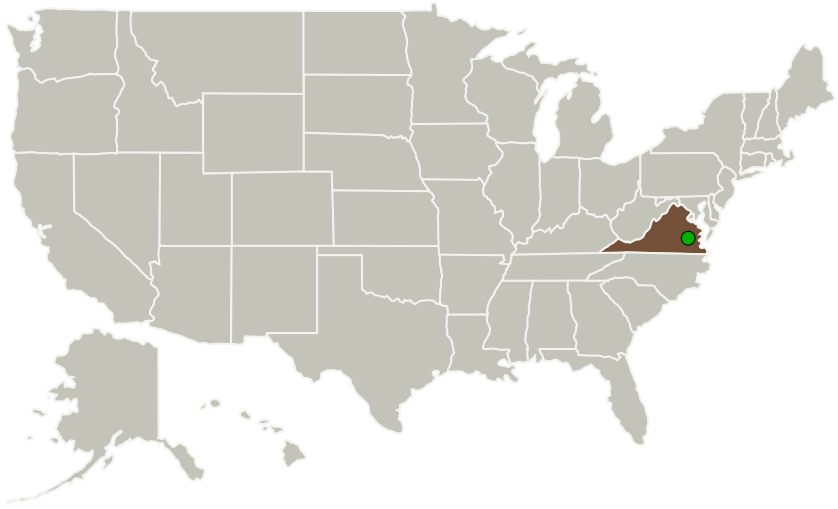
Modified Acoustic Emission for Prognostic Health Monitoring, Phase I

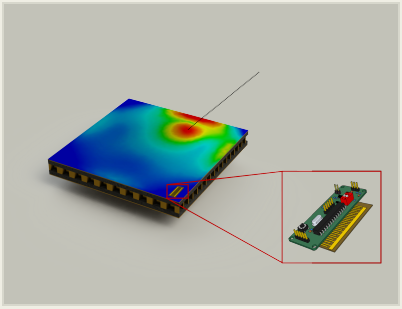
Completed Technology Project (2015 - 2016)

Project Introduction

A variety of nondestructive inspection (NDI) techniques are already available for detection of small defects within structures. These techniques, although useful, provide little insight in terms of the remaining useful life of components or structures. Furthermore, NDI techniques rely on statistical analyses of historical usage records and can often result in situations where maintenance schedules are occurring more often than necessary to insure safe operation. Intelligent monitoring of the state of constituent materials allows for operation at reduced sustainment costs without sacrificing mission safety. Prime Photonics, LC. proposes to develop a novel acoustic emission monitoring sensor as part of a larger structural health monitoring system capable of providing end-of-useful life determination. The designed acoustic emission spectrum (AES) system will combine constituent fatigue history with local impact events tp provide a complete view of component lifetime.

Primary U.S. Work Locations and Key Partners





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Completed Technology Project (2015 - 2016)

Organizations Performing Work	Role	Type	Location
Prime Photonics, LC	Lead Organization	Industry	Blacksburg, Virginia
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia
Virginia Polytechnic Institute and State University(VA Tech)	Supporting Organization	Academia	Blacksburg, Virginia

Primary U.S. Work Locations
Virginia

Project Transitions

June 2015: Project Start

June 2016: Closed out

Closeout Summary: Modified Acoustic Emission for Prognostic Health Monitoring, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139122)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Prime Photonics, LC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

David Gray

Co-Investigator:

David K Gray

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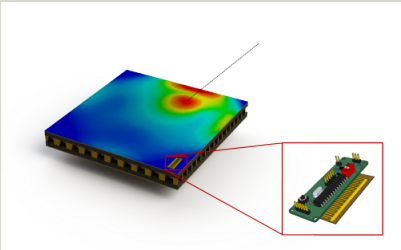
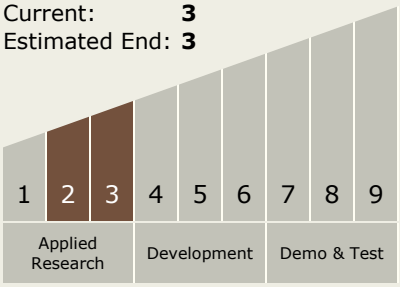
Images



Briefing Chart Image
Modified Acoustic Emission for Prognostic Health Monitoring, Phase I
(https://techport.nasa.gov/image/135175)

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.4 Manufacturing
    - TX12.4.5 Nondestructive Evaluation and Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System